Attachment H

Proposal # 2001- F212 (Office Use Only)

PSP Cover Sheet (Attach to the front of each proposal)

Proposal Title: Rainbow Trout Toxicity Monitoring: An evaluation of the role of contaminants on anadromous salmonids

Applicant Name: Central Valley Regional Water Quality Control Board

Contact Name: Karen Larsen

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Amount of funding requested: $ 530,000.00

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost _____ Federal cost _____

Cost share partners? X **Yes** ____ **No**

Identify partners and amount contributed by each State Water Resources Control Board will provide $60,000 for 3 years of sample collection. Participants in the SRWP* will provide $60,000 for 3 years of technical oversight (in-kind services)

Indicate the Topic for which you are applying (check only one box).

- ☐ Natural Flow Regimes
- ☐ Nonnative Invasive Species
- ☐ Channel Dynamics/Sediment Transport
- ☐ Flood Management
- ☐ Shallow Water Tidal/ Marsh Habitat
- ☒ Contaminants
- ☐ Beyond the Riparian Corridor
- ☐ Local Watershed Stewardship
- ☐ Environmental Education
- ☐ Special Status Species Surveys and Studies
- ☐ Fishery Monitoring, Assessment and Research
- ☐ Fish Screens

What county or counties is the project located in? Shasta, Tehama, Butte, Glenn, Colusa, Placer, Sutter, Yolo, Sacramento, and Yuba

What CALFED ecozone is the project located in? See attached list and indicate number. Be as specific as possible 1,3,4,5,6,7,8 and 9

Indicate the type of applicant (check only one box):

- ☒ State agency
- ☐ Public/Non-profit joint venture
- ☐ Local government/district
- ☐ University
- ☐ Other: _____
- ☐ Federal agency
- ☐ Non-profit
- ☐ Tribes
- ☐ Private party

*Sacramento River Watershed Program (SRWP) Toxics and Monitoring Subcommittees have participants representing CVRWQCB, SWRCB, USEPA, USGS, DFG, DPR, DWR, Deltakeeper, SRCSD, City of Sacramento, City of Redding, CUWA, MWD, CALFED, UC Davis, Pacific Eco-Risk Labs, AQUA- Science, and G. Fred Lee.

Indicate the primary species which the proposal addresses (check all that apply):

- ☐ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☒ Winter-run chinook salmon
- ☒ Late-fall run chinook salmon
- ☐ Delta smelt
- ☐ Splittail
- ☐ Green sturgeon
- ☐ White Sturgeon
- ☐ Waterfowl and Shorebirds
- ☐ Migratory birds
- ☐ Other listed T/E species: _____
- ☒ Spring-run chinook salmon
- ☒ Fall-run chinook salmon
- ☐ Longfin smelt
- ☒ Steelhead trout
- ☐ Striped bass
- ☐ All chinook species
- ☒ All anadromous salmonids
- ☐ American shad

Indicate the type of project (check only one box):

- ☒ Research/Monitoring
- ☐ Pilot/Demo Project
- ☐ Full-scale Implementation
- ☐ Watershed Planning
- ☐ Education

Is this a next-phase of an ongoing project? Yes ___ No X

Have you received funding from CALFED before? Yes ___ No X Other staff of the CVRWQCB have recieved CALFED funding

If yes, list project title and CALFED number 1998-C07, 1998-C08, 1998-C09c

Have you received funding from CVPIA before? Yes ___ No X

If yes, list CVPIA program providing funding, project title and CVPIA number (if applicable):

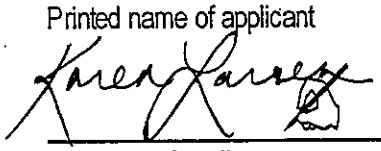
_____

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Karen Larsen

Printed name of applicant



Signature of applicant

A. EXECUTIVE SUMMARY

Title of Project: Rainbow Trout Toxicity Monitoring: An Evaluation of the Role of Contaminants on Anadromous Salmonids; Amount Requested: $530,000.00 (cost share of $120,000 provided, for a project total of $650,000.00).

Applicant: Central Valley Regional Water Quality Control Board; 3443 Routier Rd., Sacramento, CA 95827; Primary Contact: Karen Larsen; phone: (916) 255-3089; fax: (916) 255-3015; e-mail: larsenk@rb5s.swrcb.ca.gov

Participants and Collaborators: AQUA-*Science*, University of California at Davis and the Sacramento River Watershed Program. Participants in the Sacramento River Watershed Program (SRWP) are proposing this project. It will be coordinated with all SRWP activities. The SRWP is a stakeholder group dedicated to stewardship of the Sacramento River Watershed.

Many native Central Valley fish races are in decline. In particular, several stocks of Chinook salmon and steelhead have been identified as threatened or endangered. Many factors have contributed to this decline, including water quality degradation. The CVPIA identified pollution and water quality as a "moderate" limiting factor (USFWS 1999). However, a recent study in the Sacramento River Watershed, using rainbow trout embryos as the test species, found toxicity (80 to 100% mortality) in four creeks dominated by urban storm runoff and wastewater treatment plant effluent. These recent toxicity results suggest direct effects of contaminants on salmonids are possible and need to be evaluated. Therefore, any model of Central Valley salmonid population dynamics must include elements considering the direct effects of contaminants.

In this 3-year project, the Rainbow Trout Embryo Development (RTED) Test protocol will be evaluated with a suite of reference toxicants including cationic metals and pesticides that are identified as contaminants of concern in the Sacramento and San Joaquin River watersheds. Ambient samples from these watersheds will be tested using this protocol to determine if toxicity is present in the study areas. If toxicity is identified, the temporal and spatial distribution of toxicity will be determined. Finally, standard Phase I and II Toxicant Identification Evaluation (TIE) procedures will be confirmed and new TIE procedures will be developed to identify the contaminants responsible for the toxicity. Once contaminants are identified, the ecological significance of the toxicity can be determined and consensus solutions reached by SRWP participants.

The proposed study is clearly feasible; the participants performing the work have demonstrated their research abilities and project coordination skills on multiple past SRWP projects of the same and larger scope.

The geographic scope of this project is the portions of the Sacramento River Watershed located below the major reservoirs. Sampling sites will focus on critical habitats for salmonids, with an emphasis on tributaries with CALFED restoration projects. Sites exhibiting toxicity in earlier monitoring also will be included. Although limited to the Sacramento Valley, the results of this study should have relevance in both the Delta and the San Joaquin River Basin, as many land uses are similar in the three regions. The project directly addresses ERP goals 1, 3, 4, and 6 and addresses the scientific uncertainty associated with contaminants.

C. PROJECT DESCRIPTION

This project is being proposed by participants in the Sacramento River Watershed Program (SRWP). It will be coordinated with all SRWP activities. The SRWP is a stakeholder group dedicated to stewardship of the Sacramento River Watershed. The SRWP was initiated to bring people together who have an interest in the quality of water in the Sacramento River Watershed. Stakeholders in the Watershed Program are citizens, government agencies at all levels, educators, and local citizen groups with economic, regulatory, aesthetic, or personal interests in the quality of the River and its tributaries. The mission of the program, which was developed by the stakeholders in 1996, is: *To ensure that current and potential uses of the watershed's resources are sustained, restored, and where possible, enhanced, while promoting the long-term social and economic vitality of the region.* The four cornerstones of the SRWP are: (1) the comprehensive water quality and contaminant monitoring program; (2) the public education and outreach program; (3) water quality management strategies for contaminants; and (4) providing information exchange and assistance for tributary watershed groups and programs. A summary of the SRWP, its publications, its process for addressing contaminants and two letters of support from the participating subcommittees are included as an attachment to this proposal.

1. Statement of the Problem

a. Problem - Since the mid-1800's, many native Central Valley fish races have been in decline. In particular, several stocks of Chinook salmon and steelhead have been identified as threatened or endangered. Many factors have contributed to this decline, including hydraulic mining, ocean and fresh water harvest, introduction of exotic fish species, construction of dams, dikes and levees, water diversions, river and stream channelization and water quality degradation. In the six-year plan for implementing the Central Valley Improvement Act (CVPIA), the CVPIA has identified these limiting factors (or stressors), and based on current knowledge, ranked them in order of significance. Pollution and water quality is identified as a "moderate" limiting factor (USFWS 1999). Therefore, any model of Central Valley salmonid population dynamics must include elements considering the direct and indirect effects of contaminants. This information is not easy to collect.

It is always difficult to determine the exact effect water quality degradation has on a population. The three primary tools for estimating toxic effects are chemical monitoring, biological assessments and toxicity testing. Each of these approaches has strengths and limitations, and in practice, a "weight of evidence" approach is desirable. Although there is an extensive literature on salmonid toxicology, almost nothing is known about the precise role of contaminants on Central Valley populations. Biological monitoring confirms species are in decline (USFWS 1999) and chemical monitoring indicates many chemicals are present in Central Valley water bodies (Cooke and Connor 1999). A critical missing piece is an understanding of the toxicity of the system to the species of concern.

Water samples collected throughout the Sacramento and San Joaquin River Watersheds and the Delta have demonstrated intermittent toxicity using the standardized bioassay test protocol with fathead minnows (summarized in de Vlaming et al. 2000). For example,

significant fathead minnow mortality was observed in approximately 50% of the samples collected from the Sacramento River at Freeport in toxicity tests conducted at AQUA-*Science* (AQUA-*Science*, 1997; Fox and Miller, 1997) and at the University of California, Davis, Aquatic Toxicology Laboratory (UCDATL) (Larsen *et. al.*, 1998a). Toxicity Identification Evaluations (TIEs are procedures to identify the specific chemical causing the observed toxicity) conducted at AQUA-*Science* showed that the fungicide, Ziram, had similar characteristics of toxicity as the toxic River samples (AQUA-*Science*, 1997). However, the seasonal distribution of fathead minnow toxicity observed in the samples from the Sacramento River Watershed Program (SRWP) suggests that Ziram cannot account for all of the observed toxicity. Therefore, the causes of the fathead minnow toxicity are currently uncharacterized.

However, recent comparative studies conducted at UCDATL and AQUA-*Science* (and funded by CALFED) suggest that much of the fathead minnow mortality observed in the SRWP samples may have been due to ambient pathogens (AQUA-*Science*, 1999; Larsen *et. al.*, 1998b-d). This pathogen-related toxicity has also been reported in fathead minnow toxicity tests with ambient samples in other monitoring programs conducted across the U.S. (Kszos *et. al.*, 1997, Stewart, *et. al.*, 1990). The pathogen-related toxicity manifests as an atypical (non-monotonic) dose response, has high variability among sample replicates, has a delayed onset of toxicity, exhibits species specificity (does not typically occur in *Ceriodaphnia*) and is prevented by addition of antibiotics to the ambient sample. The issue of pathogen-related fathead minnow toxicity has recently been reviewed by a SETAC Expert Panel (SEP) and a preliminary report is available (SETAC, 1999). The SETAC panel report suggests several options for controlling the pathogen-related toxicity. However, none of these procedures has been subjected to scientific evaluation. Recent studies conducted at AQUA-*Science* (in preparation) have shown that addition of antibiotics enhances the growth of fathead minnow controls and decreases the toxicity of copper to fathead minnows by approximately 2 fold. Other procedures suggested by the SEP to reduce the incidence of pathogen-related fathead minnow toxicity including filtration, UV irradiation, and autoclaving are impractical for various reasons. Another problem with the fathead minnow test is that this test may not adequately predict toxicity to other fish species including the salmonids, which are threatened in the Sacramento River Watershed.

Recently, the University of California, Davis Aquatic Toxicology Laboratory (UCD ATL)) conducted a preliminary 5-month toxicity survey of the Sacramento River Basin using a Rainbow Trout Egg Development (RTED) Test protocol (Canaria and Bailey 1998). The results (Kimball *et al.* 1997; Reyes *et al.* 2000) suggest that the assay may provide valuable information on the effects of pollutants on salmonid survival in the Sacramento-San Joaquin Watersheds. UCD ATL evaluated the procedure in a preliminary study in which toxicity to the rainbow trout was detected in urban runoff dominated creeks and effluent influenced water bodies (Kimball *et al.*, 1997; Reyes *et al.*, 2000). This finding is the first time toxicity to a salmonid species has been detected in a toxicity testing program in the Central Valley. Until now, most conceptual models have not emphasized direct contaminant effects because of a lack of data supporting the relationship. These preliminary results demand that increased attention be focused in this area.

The goal of the proposed study is to determine the toxicity of Sacramento River Basin water bodies to rainbow trout embryos, as an indicator of contaminant effects on Central Valley salmonids. To achieve this goal, a three-year study is proposed with the following objectives:

a. Investigate the feasibility, sensitivity and applicability of the RTED Test for assessment of toxicity to salmonids in the Sacramento River Watershed.
b. Determine if toxicity is detectable in tributaries and main stem locations during critical spawning and incubation periods (Figure 2).
c. Determine if toxicity is detectable in tributaries and main stem locations identified as critical salmonid habitat (Figures 3 and 4).
d. Determine the nature of the observed toxicity detected in urban run off-dominated creeks and effluent dominated water bodies.
e. Develop a computerized system using a digital image-based scoring system for evaluating toxic effects to the rainbow trout embryos.
f. Determine the temporal and spatial characteristics of any toxicity identified by the RTED Test.
g. Modify existing, or develop new, Phase I and II TIE procedures for the RTED Test to identify the chemical constituents responsible for the toxicity.
h. Conduct Phase I and II TIEs to identify the chemical constituents responsible for the toxicity detected employing the RTED Test.

In this 3-year project, the RTED Test protocol will be evaluated with a suite of reference toxicants including cationic metals and pesticides that are identified as contaminants of concern in the Sacramento and San Joaquin River watersheds. Ambient samples from these watersheds will be tested using this protocol to determine if toxicity is present in the study areas. If toxicity is identified, the temporal and spatial distribution of toxicity will be determined. Finally, standard Phase I and II Toxicant Identification Evaluation (TIE) procedures will be confirmed and new TIE procedures will be developed to identify the contaminants responsible for the toxicity.

An initial assessment of the Rainbow Trout Development Test, conducted at the UCDATL and AQUA-*Science*, has shown the test to be a sensitive indicator of toxicity caused by selected reference toxicants including pyrethroids, OP insecticides and copper (Kimball et al. 1998). Observed LC50's were similar to published values for swim-up fry, which are traditionally thought to be the most sensitive salmonid life stage (Reyes *et al.* 2000). However these initial studies also revealed a problem in obtaining consistency between investigators in quantitatively evaluating test endpoints. To address this problem, AQUA-*Science* has developed a digital image-based scoring system for determination of endpoint(s) in the RTDT. The system uses a digital camera (Pixera Pro™) attached to a trinocular compound microscope to capture a digital image of the trout embryos. The image is processed using computer software (Sigma Scan Pro™) to obtain standardized measurements of embryo growth and development. The images can be stored on CD ROM disks to document effects and/or for later analysis using different endpoints. The use of this system in conjunction with the RTDT has not been previously reported in the literature. AQUA-*Science* is currently adapting the imaging system for measurement of endpoints in toxicity tests and TIEs with echinoderms, abalone and kelp.

b. Conceptual Model - Restoration of salmonids is a major focus of both CALFED and the CVPIA. A number of conceptual models have been developed that suggest many environmental stressors have the potential to impact certain salmonid life stages. These models identify poor habitat quantity and quality as the primary current stressors on salmonid populations. The major focus of many CALFED-funded studies has been on improving habitat quantity and physical habitat quality, but not water quality (i.e., contaminants). As a result, little is known about the effects of contaminants on salmonid populations. Some studies funded by CALFED are attempting to address the effects of contaminants on salmonids, but focus on the indirect effects. These include reduction of the salmonid food supply due to toxicity to zooplankton populations. The conceptual model for this proposal focuses on the direct toxicity of contaminants to a critical life stage of salmon, embryonic development (Figure 1).

Several studies have documented toxicity to surrogate species of fish (fathead minnow) in urban runoff and effluent influenced water bodies (AQUA-*Science*, 1997; Fox and Miller, 1997; Larsen *et al.*, 1998). Surrogates for salmonids in toxicity testing have been useful because the protocols have been established by the U.S. EPA (1994) and the methods are cost effective. In answer to concerns that surrogate species are inadequate to characterize toxicity to salmonid species, Canaria and Bailey (1998) designed a toxicity test employing Rainbow Trout Embryo Development. UCD ATL evaluated the procedure in a preliminary study in which toxicity to the rainbow trout also was detected in urban runoff dominated creeks and effluent influenced water bodies (Kimball *et al.*, 1997; Reyes *et al.*, 2000). This finding is the first time toxicity to a salmonid species has been detected in a toxicity testing program. Until now, most conceptual models have not emphasized direct contaminant effects because of lack of data. The conceptual model for salmonid survival requires a better look at the potential for direct contaminant effects. The proposed project builds on the preliminary study, with comprehensive (spatially and temporally) sampling, focused on sites and land uses exhibiting toxicity in the earlier studies, as well as on critical salmonid habitats. In addition, when toxicity is detected, protocols will be employed to identify the specific contaminants. Once specific contaminants are identified, whether the toxicity is ecologically significant and the sources of the toxicity must be determined. The data collected can then provide the framework for public participation and stakeholder involvement in developing water quality management strategies (and an appropriate monitoring program to assess the success of the strategies) to reduce the effects of contaminants on salmonid populations in the Sacramento River Watershed. Although this study will be conducted in the Sacramento River Watershed, information will be applicable to salmonid habitats throughout the Central Valley. This evaluation of "regional applicability" following a specific toxicant identification is a standard step in the Ambient Toxicity Monitoring Programs of the Regional Board (de Vlaming et al. 2000).

c. Hypothesis Tested – The hypothesis of this proposal is that the RTED can be developed into a sensitive and reproducible toxicity test procedure that can be applied to identify the role of contaminants on a critical life-stage of "at risk" salmonid species in the Sacramento-San Joaquin Bay Delta System.

The data necessary to test this hypothesis are fully described in the proposal Scope of Work and include development of an image-based scoring system to standardize test

endpoint(s), determination of the sensitivity of the RTED test for detection of toxicity using a suite of selected reference toxicants, conducting toxicity tests on ambient samples from salmonid critical habitat areas, and if toxicity is detected, identifying the chemical causes of toxicity using standard or modified TIE procedures.

Successful development and application of the RTED will provide information relevant to the following ERP and CVPIA goals including:

- Identification of the role of contaminants to "at risk" salmonid species (ERP Goal 1)
- Increasing numbers and diversity of harvestable species (ERP Goal 3).
- Assessing the role of toxicants on critical salmonid habitats including areas that are currently being restored by ongoing CALFED projects (ERP Goal 4)
- Identify and characterize toxic impacts on sediment and water quality to focus stake holder-based management strategies (ERP Goal 6).
- Provide information to define the relationship between contaminant concentrations, bioavailability and direct effects on salmonid development (PSP p. 35)
- Make all reasonable efforts to at least double natural production of anadromous fish (CVPIA restoration goal).
- Restoration of ecosystem function and viability (CVPIA biological principle)
- To the extent possible, partnerships with others will be developed to implement provisions of the CVPIA (CVPIA non-biological principle).

d. Adaptive Management - Adaptive management is an established goal of all SRWP subcommittees and projects. When the Toxics and Monitoring Subcommittees of the SRWP began working on contaminant issues, they summarized the existing information, began monitoring to fill data gaps and selected two topic areas where additional monitoring information was necessary before a water quality management strategy could be developed. Toxicity of unknown origin was one of the two areas.

All aspects of this proposed project incorporate the concept of adaptive management. First, this project already is framed from information gathered and lessons learned during previous studies. For example, toxicity to surrogate species of fish (fathead minnows) in samples collected from throughout the Sacramento River Watershed has been detected, however, how the observed toxicity relates to salmonid species was unclear. Consequently, a protocol for identifying toxicity employing rainbow trout embryos was developed. In addition, studies conducted by the UCD ATL determined that established methods for quantitatively evaluating embryo development are too subjective. This proposed project addresses this issue by standardizing the scoring method through digital imaging technology.

Second, the study conducted by the UCD ATL was a preliminary assessment of conditions in the watershed. This proposed project expands on previous efforts with a comprehensive spatial and temporal sampling design, which will help identify land use practices that may contribute to toxicity. Sampling locations will include critical salmonid habitats, but also focus on urban runoff-dominated creeks and effluent dominated water bodies since these two sources of contaminants were observed to cause acute mortality in the preliminary study.

Third, established Toxicity Identification Evaluation Procedures (TIEs) will be adapted to produce TIE methods appropriate for identifying specific chemical(s) causing toxicity to salmonids. Information on geographic sources and on the specific chemical will be linked to identifying land use practices causing the toxicity. This approach has been extremely successful in earlier toxicity assessments (summarized in Cooke and Connor 1999 and de Vlaming *et al.* 2000).

Finally, SRWP participants and stakeholder groups can use this information to identify water quality management strategies that will reduce contamination and improve the water quality of salmonid habitat. In addition, continued toxicity monitoring can track the efficacy of the contaminant control program.

e. Educational Objectives - Public Outreach and Education is one of the primary goals of the SRWP. The SRWP has a Public Outreach and Education Subcommittee with the following mission: *To facilitate the exchange of information concerning the watershed and to encourage the broadest based participation in the management, protection and enhancement of the Sacramento River Watershed.* Increased public understanding of resource and contaminant issues will be necessary if we are to develop consensus–based solutions. Although the proposed study is not being submitted as an Environmental Education Project, the existing "infrastructure" of the SRWP will be used to help educate stakeholders on the goals, objectives and results of this study. SRWP education and outreach tools include a website (Sacriver.org) where the proposal and all reports will be posted; a quarterly newsletter, "*Waterways*" which will publish periodic updates; a traveling display booth which will have information on the project; and regularly scheduled meetings and education workshops where current status of SRWP projects are actively "liaisoned" to participants. Over 1000 individuals routinely receive information on SRWP activities.

2. Proposed Scope of Work

a. Location and/or Geographic Boundaries of the Project – The proposed study area is illustrated in Figures 3 and 4. Figure 3 shows general sampling site locations in relation to critical salmonid habitats and existing CALFED Ecosystem Restoration Projects. Figure 4 is a USGS quad map of the study area. Specific sites have not been selected and the study area is too large to provide the type of USGS quad map indicating all sites. This information will be provided following site selection.

The proposed study will include sampling in 10 counties: Shasta, Tehema, Butte, Glen, Colusa, Sutter, Yuba, Yolo, Placer, and Sacramento Counties.

The proposed study will include sampling in 9 ecological zones: the Delta (Sacramento River inflow), Sacramento River, North Sacramento Valley, Cottonwood Creek, Colusa Basin, Butte Basin, Feather R. Sutter Basin, American River Basin, and Yolo Basin.

b. Approach - In this 3-year project, the RTED Test protocol will be evaluated with a suite of reference toxicants including cationic metals and pesticides that are identified as contaminants of concern in the Sacramento and San Joaquin River watersheds. Following test validation and optimization, ambient samples from these watersheds will be tested using this protocol to determine if toxicity is present in the study areas. Sampling locations will focus on two areas: critical habitat and sites where toxicity has

already been detected. If toxicity is identified, the temporal and spatial distribution of toxicity will be determined. Finally, standard Phase I and II Toxicant Identification Evaluation (TIE) procedures will be confirmed and new TIE procedures will be developed to identify the contaminants responsible for the toxicity. The scope of the project is outlined below as the specific tasks necessary to complete the project.

Task 1. Project Management and Administration (entire project period)

1.1 The contractor will be responsible for the projects administration and tracking and all necessary subcontracting.

1.2 The subcontractor will provide all technical and administrative services as needed for completion of the subcontract, including supervising, monitoring, and reviewing all work performed. The subcontractor will assure that the contract is completed within budget, on schedule, and in accordance with approved procedures, applicable laws and regulations.

1.3 The subcontractor will maintain regular communications with the Contract Manager (Karen Larsen) with regard to experimental approaches and results through submission of quarterly reports according to the subcontract schedule. Subcontract execution will occur within 4 months of the interagency agreement execution.

Task 2. Project Technical Advisory Committee (entire project period) - The Toxics and Monitoring Subcommittees of the SRWP have agreed to provide technical guidance and review for this project. Three letters of support are in the SRWP attachment to this proposal. The monitoring subcommittee will coordinate the proposed study with the SRWP monitoring program. The subcommittee meets monthly and will provide feedback on monthly oral progress reports. The Toxics Subcommittee will provide input on all technical aspects of the program. The Subcommittee meets quarterly, but discusses issues in "real time" via an e-mail focus group.

Task 3. Quality Assurance Program - The subcontractor shall design and implement a Quality Control/Quality Assurance Plan to satisfy the requirements in USEPA 40 CFR and the SWRCB QA/QC documents. The subcontractor's QA/QC officer will administer the QA/QC plan. Since much of the work in this subcontract involves research, QA/QC plans will necessarily evolve and be produced as the research progresses. Therefore, it is envisioned that multiple QA/QC plans will be developed, as appropriate, for each experimental procedure as work progresses.

Task 4. Investigate Feasibility, Sensitivity and Applicability of the RTED Test for Detection of Chronic Toxicity to Salmonids - A suite of reference toxicants including selected cationic metals, pesticides and other contaminants of concern in the study area will be tested using the RTED Test. The protocol will be optimized for sensitivity by evaluating the effect of increased replicates, longer test duration, use of multiple test endpoints and scoring procedures. Appropriate statistical procedures will be developed for analysis of the test endpoint data. This task will be completed within 1 year of subcontract execution.

Task 5. Develop Computerized Digital Image-Based Scoring System for the RTED Test - A computer based digital Image-based scoring system will be developed for the RTED Test. The system will consist of a digital video camera affixed to a multi-objective

microscope equipped with a trinocular head. The image will be digitized into a JPG or TIF file format and recorded onto a CD-ROM disk. The images will be analyzed with image processing software to facilitate quantitation of effects. This system will facilitate development, training and implementation of a standardized scoring system for the RTED Test protocol.

Task 6. Collect Ambient Samples for Toxicity Tests - Samples will be collected in accordance with the procedures outlined in the QAPP.

Task 7. Conduct RTED Test Toxicity Tests on Ambient Samples - Ambient samples will be tested using the RTED Test protocol (optimized as described in Task 4). If toxicity is detected, the additional samples from the toxic sites will be tested to determine the temporal and spatial characteristics of the toxicity.

Task 8. Confirm Standard TIE Methods and Develop New TIE Procedures for the RTED Test to Identify Causes of Toxicity in Ambient Samples - Standard Phase I, II and III TIE procedures outlined by EPA (1992, 1993a, 1993b) and in published TIE procedures, e.g., Connor (1991), Bailey et al. (1996), Clark (in preparation), and Larsen, et al. (1998b), may be inadequate to identify the causes of toxicity detected in the RTED Test. The use of standard TIE reagents, e.g., methanol, EDTA, PBO and sodium thiosulfate, will be evaluated. New TIE methodologies will be developed as required. Such procedures may include improved methods for identification of toxicity due to cationic metals, non-polar organics (including pesticides and fungicides), polar organics, ammonia and surfactants. This work will begin in Year 1.

Task 9. Conduct RTED Test Toxicity Identification Evaluations (TIEs) on Ambient Samples - At the discretion of the Contract Manager, TIEs will be conducted on samples from the SRWP monitoring program that demonstrate significant toxicity due to contaminants in the RTED Test. The TIEs will utilize standard Phase I, II and III TIE approaches to identify the cause(s) of toxicity. If these TIE methods/approaches are not successful in identifying the cause(s) of toxicity, the standard TIE procedures may need to be modified and/or new TIE approaches may need to be developed to identify the toxicants as described in Task 8.

Task 10. Reporting - The subcontractor will provide timely information to the Contract Manager on the results of ambient toxicity tests so that additional follow-up testing can be initiated without delay. In addition, close communication will be monitored with the Contract Manager on progress of research associated with all project tasks. Decisions on key aspects of the research will be made after consultation with the Contract Manager. The subcontractor shall provide a description of work performed under each Task, any problems, remedial measures and assessment of the effects of problems on the study goals. The report shall include all relevant toxicity, chemical, and water quality data, and the results of the QA/QC review. The report will be available on computer disk. Where appropriate, the data will be prepared and presented in a format suitable for publication in a peer-reviewed scientific journal. After an appropriate review period, the contractor will provide the subcontractor with any corrections/modifications to the draft report. The final report will be issued within 30 days thereafter.

Schedule of Completion Dates

Product	*Date*
Monitoring Plan	30 Days after approval of subcontract
QA/QC Manual	30 Days after approval of subcontract
Quarterly Reports	Quarterly after approval of Contract
Draft Final Report	90 days before completion of subcontract
Final Report	30 days before completion of subcontract

D. Applicability to CALFED ERP Goals and Implementation Plan and CVPIA Priorities - The proposed study directly addresses two of CALFED's four objectives: Ecosystem Quality ("Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species.); and Water Quality (Provide good water quality for all beneficial uses.)

1. ERP Goals and CVPIA Priorities - The proposed study directly addresses several of the Ecosystem Restoration Goals, as stated in the PSP.

Goal 1 – At Risk Species: The role of contaminants on "at-risk" salmonid species is an area of "scientific uncertainty". This project will address this specific information gap. Toxicity testing with formally listed populations is prohibited by the Endangered Species Act, so a surrogate population must be used. Rainbow trout, *Oncorhynchus mykiss*, is the same species as the formally listed Central Valley steelhead. It is also closely related to Chinook salmon, so it is the ideal test species.

Goal 3 – Harvestable Species: This project focuses directly on salmonid species that are important species for sustainable commercial and recreational harvest.

Goal 4- Habitats: Although habitats are usually defined through some combination of physical and biotic features, the chemical habitat is also important and should not be ignored. The proposed study focuses on the chemical integrity of critical salmonid habitats including the areas currently being restored and rehabilitated by CALFED.

Goal 6- Sediment and Water Quality: The goal "to improve and maintain water and sediment quality to eliminate, to the extent possible, toxic impacts on organisms in the system, including humans" is met by this project. The project proposes to quantify and identify toxic impacts and use this information to develop management strategies in a stakeholder-based program, the SRWP.

Scientific Uncertainties: The ERP strategic Plan identified twelve areas of scientific uncertainty on which better information and understanding is needed in order to proceed with ecosystem restoration and make the critical decisions facing CALFED in the future. The proposed study will provide information in the following area:

Contaminants in the Central Valley: "The Bay-Delta Ecosystem receives a large variety of potential toxicants. High exposures of aquatic organisms to many of these compounds occur in the late winter and spring, when water runoff from land is greatest and many aquatic species reproduce and whose eggs, larvae and juveniles are the most susceptible stages to contaminants." (PSP p.35). The proposed study looks at developing

eggs, a critical life stage, throughout the hydrologic cycle, including the periods of high run-off.

The proposed study indirectly addresses the of the CVPIA restoration goal, as stated in the PSP, including: "make all reasonable efforts to at least double natural production of anadromous fish". The proposed study also addresses the biological principle: "Natural habitat components and the restoration of ecosystem function and viability will be emphasized in the planning and implementation of the CVPIA." Finally, the proposed study addresses the non-biological principle: "To the extent possible, partnerships with others will be developed to implement provisions of the CVPIA.

2. Relationship to Other Ecosystem Restoration Projects - To date, CALFED's Ecosystem Restoration Program has funded 272 projects for a total of $284 million. The Program has funded fish screens, fish ladders, land acquisition, habitat restoration, and focused research and monitoring designed to provide information that will improve future restoration efforts. Most of theses projects have focused on the restoration of anadromous salmonid fisheries. None of the funding has been allocated to looking directly at the impact of contaminants on the Valley's salmonid populations. However, several studies are looking at potential indirect effects caused by contaminant effects on the invertebrate food supply. The absence of projects on direct contaminant effects is not unreasonable. Until recently the existing salmonid toxicological literature did not suggest direct effects were likely to occur based on the current understanding of salmonid toxicology and contaminant levels in the watershed.

3. Requests for Next-Phase Funding – This is not a request for next phase funding.

4. Previous Recipients of CALFED or CVPIA Funding

5. System-wide Ecosystem Benefits – The geographic scope of this project is the regions of the Sacramento River Watershed located below the major reservoirs. Even though limited to the Sacramento Valley, the results of this study should have relevance in both the Delta and the San Joaquin River Basin, as many land uses are similar in the three regions. If a toxicant is present in one basin, it is usually detected in basins with similar land uses.

E. Qualifications - All of the key personnel in this study have experience with several projects of similar scope. The collaborators: the SRWP, Regional Board, AQUA-Science and UCD ATL have all coordinated on several ambient toxicity studies with TIE development components.

Jeffrey L. Miller, Ph.D., DABT
Study Director

Dr. Miller received his Ph.D. from the University of California, Davis in 1976 in Environmental Toxicology. After managing environmental studies for a major agricultural chemical company for 10 years, he founded AQUA-*Science*, an environmental toxicology consulting and testing firm, located in Davis, CA in 1986. For the past 24 years, he has designed and conducted numerous water-related environmental studies to determine the effects of municipal effluents, surface waters and storm water on a wide variety of freshwater, estuarine and marine organisms. Dr. Miller is a nationally recognized expert on the application of Phase I, II and III TIE procedures to identify

aquatic toxicity due to heavy metals, pesticides, ammonia, surfactants and industrial chemicals. He has developed and published many innovative TIE approaches, including chemical toxicity fingerprinting, methods to assess the interactive effects of pesticides and application of TIE methods to West Coast aquatic species. Dr. Miller has directed TIE studies that have identified causes of algal, invertebrate and fathead minnow toxicity in the Sacramento-San Joaquin River watersheds. Current research activities are focused on development of toxicity tests and TIE methods to detect toxicity to salmonids, using the trout embryo-larval development test in conjunction with computerized digital imaging techniques. Dr. Miller is the co-inventor of a patented antibody-mediated chemical-specific process for identification of toxicity due to organophosphate insecticides in aqueous matrices. He has developed and taught advanced TIE workshops at local and national scientific meetings. Dr. Miller has a total of 37 papers and abstracts in the area of environmental toxicology. He is a charter member of SETAC, and is a Board Certified Toxicologist (DABT).

Michael J. Miller, B.S.
Laboratory Manager

Mr. Miller graduated with honors in Animal Sciences from the University of California, Davis. He has served as Laboratory Manager at AQUA-*Science* for 8 years. To date, Mr. Miller has conducted and/or supervised over 1000 bioassays with municipal and industrial effluents, storm water and surface waters using a wide variety of freshwater, estuarine and marine test organisms. He has conducted numerous Phase I, II and III TIEs with *Ceriodaphnia*, larval fathead minnows, striped bass, rainbow trout, *Menidia*, algae, abalone, echinoderms and mysids. In addition, he has been instrumental in the development of new and innovative TIE methods for echinoderms, abalone, algae and *Ceriodaphnia*. As hatchery manager for a major salmonid ova producer for 8 years, he has extensive experience in salmonid husbandry, ova collection and fertilization, and disease recognition, prevention and treatment. He has performed technical studies on salmonids including photoperiod manipulation of spawning, triploidy, sexual alteration, genetic selection, and cryopreservation of gametes. He is also the co-inventor of a process for antibody-mediated chemical-specific removal of organophosphate insecticides from aqueous matrices. He has extensive experience with enzyme-linked immunosorbant assays (ELISA) and has developed lower detection limits for diazinon and chlorpyrifos. Mr. Miller has a total of 18 publications and abstracts in the area of environmental toxicology.

Karen L. Larsen, B.S.
Environmental Specialist
Project Manager

Ms. Larsen graduated with honors in Biological Sciences from the University of California, Davis. She served as Quality Assurance Officer and Data Manager at the University of California, Davis Aquatic Toxicology Laboratory (UCD ATL) for 5 years. As staff at the UCD ATL, Ms. Larsen mastered techniques in ambient water toxicity testing including U.S. EPA's three-species chronic toxicity test protocols as well as Toxicity Identification Evaluation methods. In addition, she assisted in developing the rainbow trout embryo-larval development for ambient water toxicity monitoring. Ms.

Larsen also has extensive experience in Enzyme Linked Immunosorbant Assays (ELISA) techniques. Ms. Larsen currently works as an Environmental Specialist for the Central Valley Regional Water Quality Control Board in the Sacramento River Watershed Unit where she serves as technical support in the field of aquatic toxicity. Ms. Larsen has developed 5 Quality Assurance Project Plans (QAPP), prepared quarterly progress reports for 6 toxicity monitoring projects, and written final reports for 3 yearlong toxicity monitoring projects.

F. Cost

1. Budget - The project involves both research and testing components. Unit costs for project staff for the Project Tasks are provided below. The costs for direct labor are summarized in Table 2. It is envisioned that the allocations between personnel hourly costs and testing costs will be allocated as necessary, with appropriate justification from the subcontractor and approval from the Contract Manager to achieve the project goals. Table 3 is a budget summary by task product.

Table 1. Summary of annual and total budget.

Year	Task	Direct Labor Hours[1]	Salary	Benefits	Service Contracts	Overhead	Total Cost
Year 1	Task 1		$6,968	$3,432		$9,600 (48%)	$20,000
	Task 2				$20,000	28%	$20,000
	Task 3				$5,500	28%	$5,500
	Task 4				$61,000	28%	$61,000
	Task 5				$29,500	28%	$29,500
	Task 6				$20,000	28%	$20,000
	Task 7				$100,000	28%	$100,000
	Task 8				$41,700	28%	$41,700
	Task 10				$2,200	28%	$2,200
Total Cost Year 1			$6,968	$3,432	$279,900		$299,900
Year 2	Task 1		$3,484	$1,716		$4,800 (48%)	$10,000
	Task 2				$20,000	28%	$20,000
	Task 6				$20,000	28%	$20,000
	Task 7				$100,000	28%	$100,000
	Task 9				$19,150	28%	$19,150
	Task 10				$2,200	28%	$2,200
Total Cost Year 2			$3,484	$1,716	$161,350		$171,350
Year 3	Task 1		$5,296	$2,608		$7,296(48%)	$15,200
	Task 2				$20,000	28%	$20,000
	Task 6				$20,000	28%	$20,000
	Task 7				$100,000	28%	$100,000
	Task 9				$19,150	28%	$19,150
	Task 10				$4,400	28%	$4,400

[1] See Table 2 (Personnel Budget).

Total Cost Year 3		$5,296	$2,608	$163,550		$178,750
Total Project Cost		$15,748	$7,756	$23,504		$650,000[2]

Table 2. Summary of AQUA-*Science* personnel hours and operating expenses (Does not include Regional Board or UCD expenses.

Personnel	Man-Months1	% Time2	Monthly Rate	Estimated Salary/Wages
Sr. Toxicologist V (Ph.D.)	13.2	24	$6,325.00	$83,718.00
Sr. Lab Manager III	17.7	31	$5,125.00	$90,713.00
Sr. Lab Technician III	22.9	41	$2,425.00	$57,800.00
Lab Technician II	27.3	48	$2,050.00	$55,965.00
Clerical III	8.8	16	$1,850.00	$16,280.00
QA Officer III	7.7	14	$2,120.00	$16,324.00
Subtotal Salaries and Wages				$320,800.00
Operating Expenses				
Test Organisms and Materials				$98,000.00
Chemical Analyses				$66,000.00
Subtotal Operating Expenses				$164,000.00
Total Personnel Costs and Operating Expenses				$484,800.00

[2] Includes cost share.

Table 3. Summary of total project cost by task.

Task No.	Task Description	Description of Work	Test Costs	Chemical Analyses Cost	Test Organisms and Materials	Total
1	Project Administration	Provide all technical services for project administration and management.	$45,200.00			$45,200.00
2	Technical Oversight	Collect ambient water samples.	$60,000.00			$60,000.00
3	Quality Assurance Program	Develop QA/QC plan and monitor QA/QC in all tasks during program conduct	$5,500.00			$5,500.00
4	Investigate Feasibility, Sensitivity and Applicability of RBED Test for Detection of Chronic Toxicity	Conduct up to 20 RBED tests to determine sensitivity to reference toxicants and increase sensitivity and reproducibility @ $2,500 each	$50,000.00	$2,500.00	$8,500.00	$61,000.00
		Analytical support - 10 samples @ $250/sample				
5	Develop Computerized Digital Image-Based Scoring System for the RTED Test	Develop and test digital image-based scoring system - 200 hours @ $85/hour	$17,000.00		$12,500.00	$29,500.00
6	Sample Collection	Collect ambient water samples. (cost share)	$60,000.00			$60,000.00
7	Conduct RTED Test on Ambient Samples	Conduct 300 RTED Tests on ambient samples from key sites in the Sacramento-San Joaquin Watersheds (100% only) @ $600 each	$180,000.00	$56,000.00	$64,000.00	$300,000.00
		Analytical support - 20 samples @ $250/sample				
8	Confirm Standard TIE Methods and Develop TIE Procedures for the RTED Test	Conduct and confirm standard TIE procedures (8 tests @ $2,500/test)	$10,000.00	$5,000.00	$6,700.00	$41,700.00
		Develop 2 Phase I TIE procedures @ $5,000/procedure	$10,000.00			
		Develop 1 Phase II TIE procedure @ $10,000/procedure	$10,000.00			
		Analytical support - 20 samples @ $250/sample				
9	Conduct RTED Test TIEs on Toxic Ambient Samples	Conduct 2 Phase I TIEs @ $5,000	$10,000.00	$2,500.00	$5,800.00	$38,300.00
		Conduct 2 Phase II TIEs @ $10,000	$20,000.00			
		Analytical support - 10 samples @ $250/sample				
10	Reporting	Prepare 12 progress reports, draft final report and final report	$8,300.00	---	$500.00	$8,800.00
		Totals (includes cost share)	**$486,000.00**	**$66,000.00**	**$98,000.00**	**$650,000.00**

2. Cost Sharing – Two additional sources of funding have been secured for this project. The State Water Resources Control Board provides the Regional Boards with annual allocations for monitoring and assessment. The Regional Board will designate that $20,000 of those funds for each year of the study be provide to fund the sample collection task being performed by UCD ATL. In addition, the Regional Board will provide vehicles and a boat for sampling. The other source of funding is as an "in kind" match. Participants in the Toxics and Monitoring Subcommittees have committed to provide oversight and review of the project. Core members of the subcommittees include staff from: SRWP, SRWP Resource Center, CVRWQCB, SWRCB, US EPA, USGS, DFG, DPR, DWR, DeltaKeeper, Sacramento Regional County Sanitation District, City of Sacramento, Sacramento Stormwater Program, City of Redding, CUWA, Metropolitan Water District, UC Davis, Pacific Eco-Risk Labs, AQUA-*Science*, and G. Fred Lee and Associates. Assuming an average "billable rate" of $50/hour/participant, an hour of subcommittee participation is conservatively valued at $1000/hour. A conservative estimate of 20 hours of subcommittee participation per year was used to generate an in-kind estimate of $20,000/ year for three years, for a total of $60,000

G. Local Involvement- One of the cornerstones of the SRWP is to promote the activities and missions of local watershed conservancies. This is done by providing technical assistance, such as monitoring and assessment. SRWP participants realize that it is at the local level that land use changes occur. Many of the local watershed conservancies have salmon restoration and maintenance of high water quality as goals. Projects like the proposed study need to be coordinated with these local efforts because watershed restoration activities such as contaminant control strategies are most effective when they are informed by an understanding of current conditions and supported by a monitoring program. Local participation is essential to effective long-term land stewardship. All of the local watershed conservancies for tributaries identified in this proposal for monitoring have been sent copies of the proposal. In addition, conservancies will be briefed periodically on the study results via the SRWP newsletter, *WATERWAYS*. If local watershed programs are interested in assisting with sampling, this will be coordinated. In fact, the Dry Creek Conservancy, DeltaKeeper and the Sacramento Urban Creeks Council served in that capacity in the preliminary study. In addition, when requested in the past, Regional Board staff has presented results to local conservancies at their meetings. Staff are eager to continue this tradition.

H. Compliance with Standard Terms and Conditions – The Regional Board will be the primary contracting entity with CALFED. If funding is from state funds an interagency agreement between the Resources Agency and the State Water Resources Control Board on behalf of the Regional Board would be executed. Two previous CALFED projects have already been executed with the Regional Board using this process. There would be no problem with the standard terms and conditions. If funding were from federal funds an interagency agreement would also be executed. The required federal forms and waivers are attached to this proposal.

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US FWS. 1999. Approach and Focus for Implementing the Central Valley Project Improvement Act 1999-2004. Taken from 2001 Proposal Solicitation Package. CalFed Bay-Delta Program.

J. Threshold Requirements (except for cover sheet) – attached.

K. Attachment: Summary of the Sacramento River Watershed Program

Figure 1. Conceptual Model for Rainbow Trout Embryo Development Toxicity Test Proposal

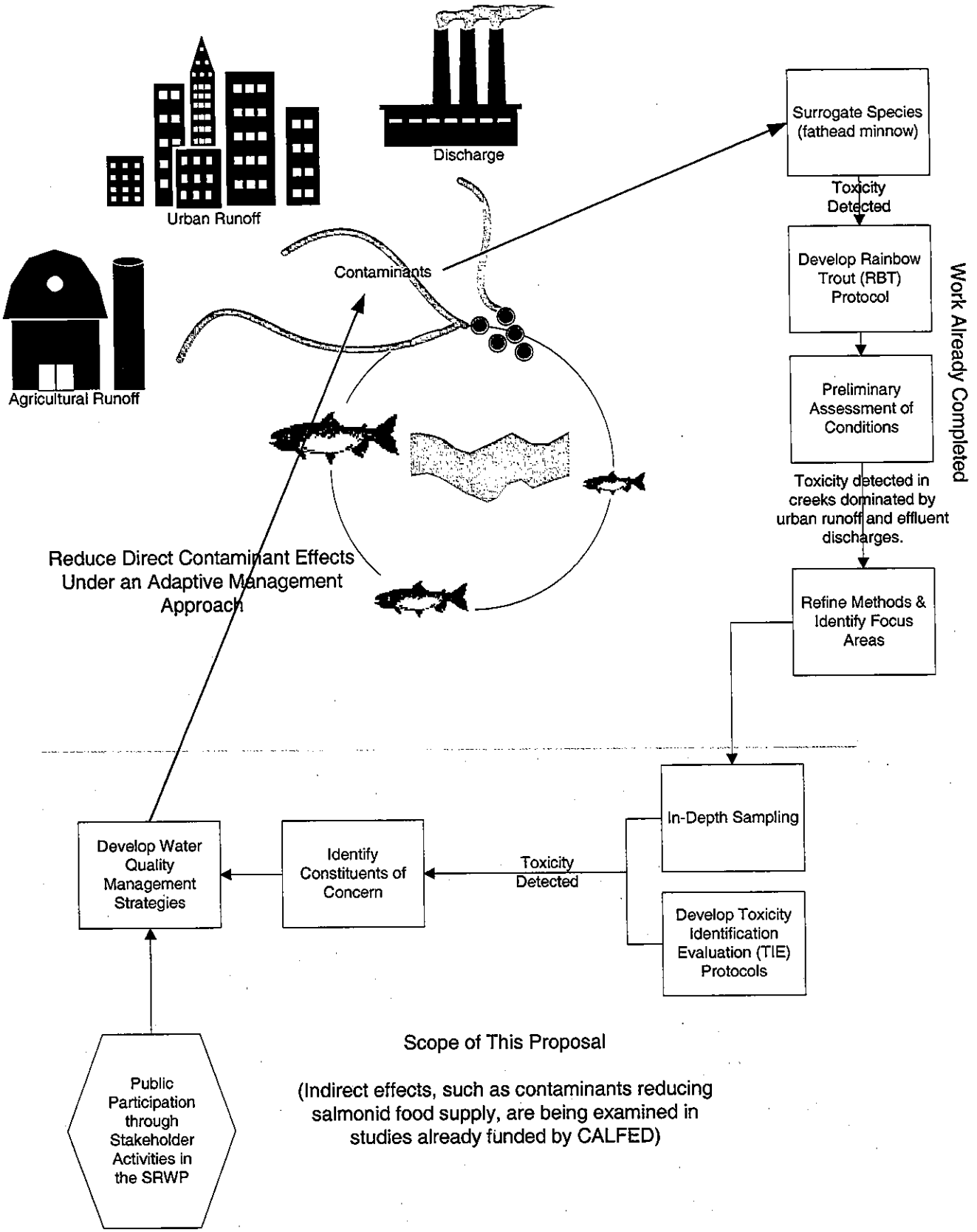


Figure 2. Summary of temporal and spatial salmonid spawning and incubation.

S - Spawning
I - Incubation

L - Late Fall run

T - Steelhead Trout

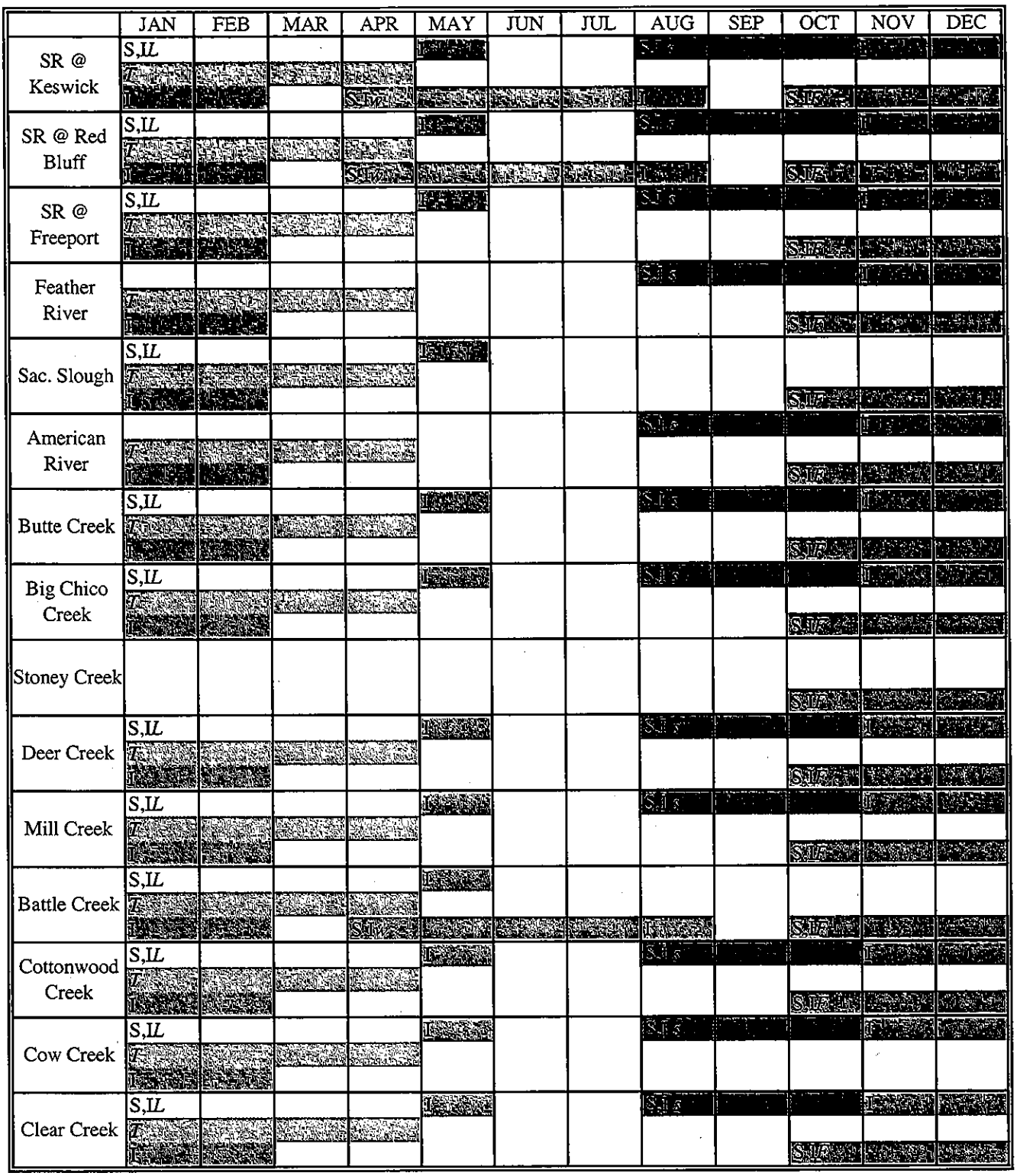


Figure 3- Map of Proposed Sampling Sites Shown in Relationship to Current Range of Proposed ESU's and Critical Habitat for Imperiled Fish Species and Locations of CalFed Restoration Projects

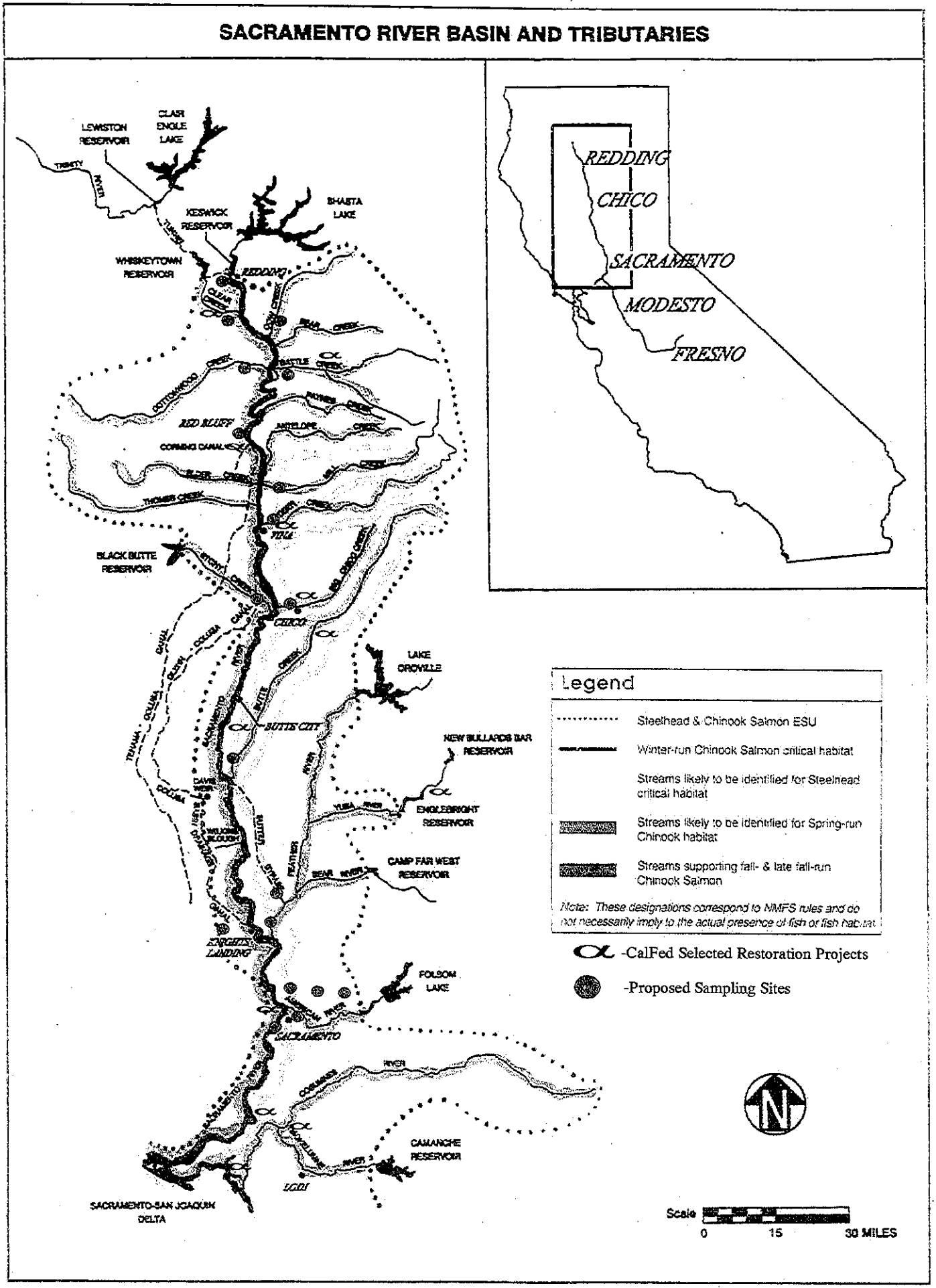
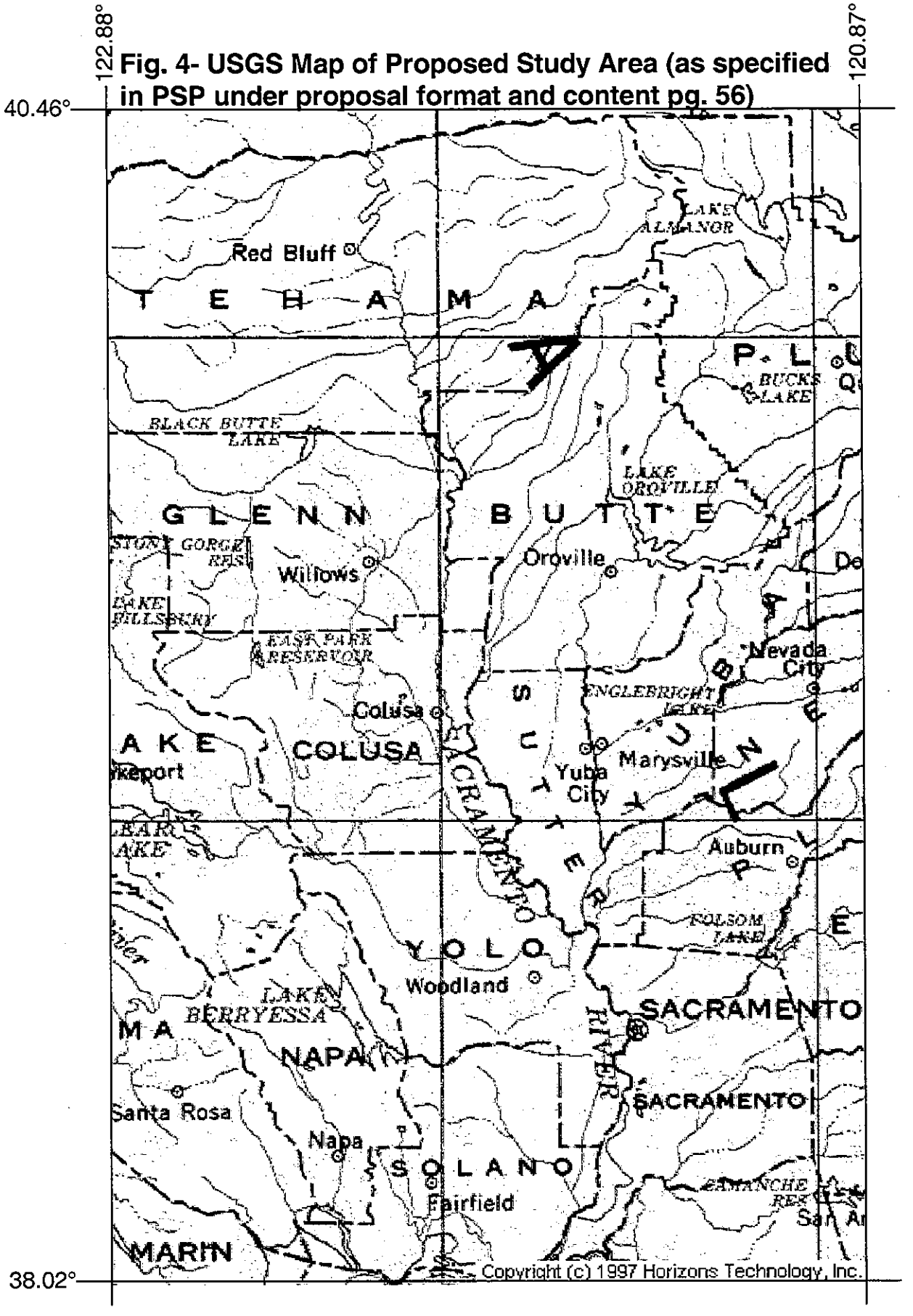


Fig. 4- USGS Map of Proposed Study Area (as specified in PSP under proposal format and content pg. 56)



California Regional Water Quality Control Board

Central Valley Region

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15 May 2000

CALFED Bay-Delta Program
1416 Ninth Street
Sacramento, CA 95814

PUBLIC NOTIFICATION REQUIREMENT

This project proposal is for laboratory research and, therefore, does not require any "physical action on the ground", except for the collection of the water samples. It should be exempt from the public notification requirement. However, as a courtesy to those local entities whose jurisdiction may encompass the monitoring sites chosen by this project, representatives were contacted with the attached letter to inform them of the project. A distribution list for the letter is also attached.

Karen Larsen

KAREN LARSEN
Environmental Specialist II

Enclosures - 2

California Regional Water Quality Control Board

Central Valley Region

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15 May 2000

To: Distribution List

RE: CALFED PROPOSAL: RAINBOW TROUT TOXICITY MONITORING—AN EVALUATION OF THE ROLE OF CONTAMINANTS ON ANADROMOUS SALMONIDS

The Sacramento River Watershed Program is a stakeholder group dedicated to stewardship of the Sacramento River Watershed. It was initiated to bring people together who have an interest in the health of the watershed of the Sacramento River. Stakeholders in the program are citizens, government agencies at all levels, educators, and local citizen groups with economic, regulatory, aesthetic, or personal interests in the quality of the watershed including its tributary watersheds. The mission of the program, as developed by the stakeholders, is: *To ensure that current and potential uses of the watershed's resources are sustained, restored, and where possible, enhanced, while promoting the long-term social and economic vitality of the region.*

The Toxics subcommittee of the SRWP has been conducting toxicity testing throughout the watershed since 1996. Standardized toxicity tests evaluate the abilities of three laboratory test species (a fish, a crustacean and an algae) to live, grow and reproduce in water samples collected from different field sites. Participants in the SRWP have expressed concern over the use of surrogate test species. They have requested that testing be done with resident species. In particular, fish toxicity tests should be conducted with salmonids because they are the major fish group of concern throughout the Watershed. A test using rainbow trout embryos (developing eggs) was developed and a preliminary five-month study was conducted by the UC Davis ATL. The results suggest that the test is sensitive and able to detect salmonid toxicity . The results also indicate that high embryo mortality can occur in sites dominated by urban storm run-off and wastewater treatment plant effluent. The Toxics Subcommittee wants to follow-up on these preliminary results with a more detailed study.

The Central Valley Regional Water Quality Control Board (Regional Board) is submitting a project proposal to CALFED for the purpose of conducting toxicity tests in the Sacramento River Watershed using rainbow trout embryos. The project will be coordinated by Regional Board staff. The laboratory tests and sample collection will be subcontracted to AQUA-Science and the UC Davis Aquatic Toxicology Laboratory. Technical oversight will be provided by the Monitoring and Toxics Subcommittees of the Sacramento River Watershed Program (SRWP).

The study will focus on water bodies that have been identified as critical habitat for salmonids, water bodies being restored for salmonids using CALFED funds, and the types of water bodies where toxicity has already been detected. Although the water bodies for the study have been selected, the specific sites for monitoring have not. Sites on, or requiring access through, private property will not be selected

unless the landowner has given written permission. Counties where sites could potentially be sought include Butte, Colusa, Glenn, Placer, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba.

This letter is intended to provide information to the counties, watershed conservancies and Resource Conservation Districts on the proposed project and its general goals and objectives. If you have any questions or concerns regarding the grant proposal or this notification, or would like to get involved, please call me at 916-255-3089.

Karen Larsen

Karen Larsen
Sacramento River Watershed Unit

Enclosures (2): Notification Letter Distribution List
CALFED Proposal

CALFED Proposal: *Rainbow Trout Toxicity Monitoring*

DISTRIBUTION LIST FOR NOTIFICATION LETTER

County	County Planning Department	Resource Conservation District (RCDs)	Clerk of Board of Supervisor's
Butte:	7 County Center Dr. Oroville, CA 95968		25 County Center Dr. Oroville, CA 95965
Colusa:	220 12th St. Colusa, CA 95932	100 Sunrise Blvd.,SteB Colusa, CA 95932	546 Jay St. Colusa, CA 95932
Glenn:	125 S. Murdock Ave. Willows, CA 95988	132 N. Enright, Ste B Willows, CA 95988	526 W. Sycamore St. PO Box 391 Willows, CA 95988
Sacramento:	827 7th St., Rm. 230 Sacramento, CA 95814		700 H St., Rm. 2450 Sacramento, CA 95814
Shasta:	1855 Placer St., Ste 103 Redding, CA 96001	215 Executive Court Ste A Yreka, CA 96097	1815 Yuba St., Ste 1 Redding, CA 96001
Sutter:	1160 Civic Center Bl., Ste E Yuba City, CA 95991	1511B Butte House Rd. Yuba City, CA 95993	1160 Civic Center Blvd. Yuba City, CA 95993
Tehama:	444 Oak St. Red Bluff, CA 96080	2 Sutter St. # D Red Bluff, CA 96080	322 Pine St. Red Bluff, CA 96080
Yolo:	292 West Beamer St. Woodland, CA 95695	221 W. Court St, Ste 1 Woodland, CA 95695	625 Court St., Rm 204 Woodland, CA 95695
Yuba:	938 14th St. Marysville, CA 95901	1511 Butte Houses Rd., Ste B Yuba City, CA 95993	215 5th St. Marysville, CA 95901

Local Watershed Conservancy List

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Deer Creek Watershed Conservancy
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Kerry Burke
Mill Creek Conservancy
P.O. Box 188
Los Molinos, CA 96055

Ken Keller
Butte Creek Watershed Conservancy
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Chico, CA 95927-1611

Mary Schroeder
Western Shasta RCD
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John Benoit, Glenn County
Resource, Plann & Develop
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Willows, CA 95988

Sharon Paquin - Gilmore
Battle Creek Watershed Conservancy
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Manton, CA 96059

John McCullah
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Redding, CA 96002

Suzanne Gibbs
Big Chico Creek Watershed Alliance
602 Sycamore Street
Chico, CA 95928-0003

Vicky Dawley
Tehama County Resources Conservation District
2 Sutter Street, Suite D
Red Bluff, CA 96080

Local Watershed Conservancy List

Burt Bundy, Sac River Conservation Area
CA Dept of Water Resources
2440 Main Street
Red Bluff, CA 96080

Loretta Carrico
Cottonwood Creek Watershed Group
3605 Bechelli Lane
Redding, CA 96002

Linda Cole
Cherokee Watershed
7399 Highway 99
Oroville, CA 95965

Gregg Bates
Dry Creek Conservancy
P.O. Box 1311
Roseville, CA 95678-8311

Environmental Compliance Checklist

All applicants must fill out this Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. *Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.*

1. **Do any of the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?**

   _____ YES X NO

2. **If you answered yes to # 1, identify the lead governmental agency for CEQA/NEPA compliance.**

   _____
   Lead Agency

3. **If you answered no to # 1, explain why CEQA/NEPA compliance is not required for the actions in the proposal.**

   This is a toxicity study involving no physical changes to the land. The only actions in the field will be water sample collection- approximately 5 gallons/month from up to 20 sites. River access will be primarily via public property. Before sampling from private property, permission for access will be obtained.

4. **If CEQA/NEPA compliance is required, describe how the project will comply with either or both of these laws. Describe where the project is in the compliance process and the expected date of completion.**

5. **Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?**

   X YES _____ NO

   If yes, the applicant must attach written permission for access from the relevant property owner(s). Failure to include written permission for access may result in disqualification of the proposal during the review process. Research and monitoring field projects for which specific field locations have not been identified will be required to provide access needs and permission for access with 30 days of notification of approval.

   If specific field locations are identified that require access via private property permission for access will be requested. This will occur within 30 days of notification approval. The Watershed Conservancies for the tributary watersheds are being sent copies of this project proposal.

6. Please indicate what permits or other approvals may be required for the activities contained in your proposal. Check all boxes that apply.

LOCAL		
Conditional use permit	___	
Variance	___	
Subdivision Map Act approval	___	
Grading permit	___	
General plan amendment	___	
Specific plan approval	___	
Rezone		___
Williamson Act Contract cancellation	___	
Other _____ (please specify)		
None required	X	
STATE		
CESA Compliance	___	(CDFG)
Streambed alteration permit	___	(CDFG)
CWA § 401 certification	___	(RWQCB)
Coastal development permit	___	(Coastal Commission/BCDC)
Reclamation Board approval	___	
Notification	___	(DPC, BCDC)
Other _____ (please specify)		
None required	X	
FEDERAL		
ESA Consultation	___	(USFWS)
Rivers & Harbors Act permit	___	(ACOE)
CWA § 404 permit	___	(ACOE)
Other _____ (please specify)		
None required	X	

DPC = Delta Protection Commission
CWA = Clean Water Act
CESA = California Endangered Species Act
USFWS = U.S. Fish and Wildlife Service
ACOE = U.S. Army Corps of Engineers

ESA = Endangered Species Act
CDFG = California Department of Fish and Game
RWQCB = Regional Water Quality Control Board
BCDC= Bay Conservation and Development Comm.

Land Use Checklist

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. *Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.*

1. **Do the actions in the proposal involve physical changes to the land(i.e. grading, planting vegetation, or breeching levees) or restrictions in land use (i.e. conservation easement or placement of land in a wildlife refuge)?**

   _____ YES X NO

2. **If NO to # 1, explain what type of actions are involved in the proposal (i.e., research only, planning only).**

   This is a research/ monitoring study that only involves collection of water samples.

3. **If YES to # 1, what is the proposed land use change or restriction under the proposal?**

4. **If YES to # 1, is the land currently under a Williamson Act contract?**

   _____ YES _____ NO

5. **If YES to # 1, answer the following:**

   Current land use _____
   Current zoning _____
   Current general plan designation _____

6. **If YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance or Unique Farmland on the Department of Conservation Important Farmland Maps?**

   _____ YES _____ NO _____ DON'T KNOW

7. **If YES to # 1, how many acres of land will be subject to physical change or land use restrictions under the proposal?**

   _____

8. **If YES to # 1, is the property currently being commercially farmed or grazed?**

   _____ YES _____ NO

9. **If YES to #8, what are** **the number of employees/acre**_____
   the total number of employees _____

10. Will the applicant acquire any interest in land under the proposal (fee title or a conservation easement)?

_____	X
YES	NO

11. What entity/organization will hold the interest?_____

12. If YES to # 10, answer the following:

Total number of acres to be acquired under proposal	_____
Number of acres to be acquired in fee	_____
Number of acres to be subject to conservation easement	_____

13. For all proposals involving physical changes to the land or restriction in land use, describe what entity or organization will:

manage the property	_____
provide operations and maintenance services	_____
conduct monitoring	_____

14. For land acquisitions (fee title or easements), will existing water rights also be acquired?

_____	_____
YES	NO

15. Does the applicant propose any modifications to the water right or change in the delivery of the water?

_____	_____
YES	NO

16. If YES to # 15, describe_____

APPLICATION FOR FEDERAL ASSISTANCE

OMB Approval No. 0348-0043

2. DATE SUBMITTED	Applicant Identifier
May 15, 2000	
3. DATE RECEIVED BY STATE	State Application Identifier
4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

1. TYPE OF SUBMISSION:

Application	Preapplication
☐ Construction	☐ Construction
☒ Non-Construction	☐ Non-Construction

5. APPLICANT INFORMATION

Legal Name: State Water Resources Control Board

Organizational Unit: Central Valley Regional Water Quality Control Board

Address *(give city, county, State, and zip code)*:
CVRWQCB 3443 Routier Rd
Sacramento, Sacramento County 95827

Name and telephone number of person to be contacted on matters involving this application *(give area code)*
Karen Larsen (916) 255-3089

6. EMPLOYER IDENTIFICATION NUMBER *(EIN)*:
68 – 0281986

7. TYPE OF APPLICANT: *(enter appropriate letter in box)* A

A. State
B. County
C. Municipal
D. Township
E. Interstate
F. Intermunicipal
G. Special District
H. Independent School Dist.
I. State Controlled Institution of Higher Learning
J. Private University
K. Indian Tribe
L. Individual
M. Profit Organization
N. Other (Specify) _____

8. TYPE OF APPLICATION:

☒ New ☐ Continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es) ☐ ☐

A. Increase Award B. Decrease Award C. Increase Duration
D. Decrease Duration Other *(specify)*:

9. NAME OF FEDERAL AGENCY:

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER:

☐☐ – ☐☐☐

TITLE: NA

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:

Rainbow Trout Toxicity Monitoring: An evaluation of the role of contaminants on anadromous salmonids in the Sacramento River Watershed

12. AREAS AFFECTED BY PROJECT *(Cities, Counties, States, etc.)*:

Sacramento River Basin of California (10 counties)

13. PROPOSED PROJECT		14. CONGRESSIONAL DISTRICTS OF:	
Start Date	Ending Date	a. Applicant	b. Project
10/00	12/03	5	1,2,3,4,5

15. ESTIMATED FUNDING:

a. Federal	$ 530,000.00
b. Applicant	$ 60,000.00
c. State	$ .00
d. Local	$ .00
e. Other	$ 60,000.00
f. Program Income	$ .00
g. TOTAL	$ 650,000.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:

DATE _____

b. No. ☐ PROGRAM IS NOT COVERED BY E. O. 12372
☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

☐ Yes If "Yes," attach an explanation. ☐ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Type Name of Authorized Representative	b. Title	c. Telephone Number
Gary M. Carlton	Executive Officer	(916) 255-3000
d. Signature of Authorized Representative		e. Date Signed
Gary M. Carlton		May 15, 2000

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Prescribed by OMB Circular A-102

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Year 1		$	$	$ 259,900	$ 40,000	$ 299,900
2. Year 2				131,350	40,000	171,350
3. Year 3				138,750	40,000	178,750
4.						
5. Totals		$	$	$ 530,000	$ 120,000	$ 650,000

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
	(1) Yr 1	(2) Yr 2	(3) Yr 3	(4)	(5)
a. Personnel	$ 6,968	$ 3,484	$ 5,296	$	$ 15,748
b. Fringe Benefits	3,432	1,716	2,608		7,756
c. Travel					
d. Equipment					
e. Supplies					
f. Contractual	239,900	121,350	123,550		484,800
g. Construction					
h. Other	40,000	40,000	40,000		120,000
i. Total Direct Charges *(sum of 6a-6h)*	290,300	166,550	171,454		828,304
j. Indirect Charges	9,600	4,800	7,296		21,696
k. TOTALS *(sum of 6i and 6j)*	$ 299,900	$ 171,350	$ 178,750	$	$ 650,000
7. Program Income	$	$	$	$	$

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. Sample Collection (SWRCB funds)	$	$ 60,000	$	$ 60,000
9. Technical Assistance (In-kind match)			60,000	60,000
10.				
11.				
12. TOTAL *(sum of lines 8-11)*	$	$ 60,000	$ 60,000	$ 120,000

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 259,900	$ 109,900	$ 50,000	$ 50,000	$ 50,000
14. Non-Federal	40,000	10,000	10,000	10,000	10,000
15. TOTAL *(sum of lines 13 and 14)*	$ 299,900	$ 119,900	$ 60,000	$ 60,000	$ 60,000

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.	$ 259,900	$ 131,350	$ 138,750	$ —
17.				
18.				
19.				
20. TOTAL *(sum of lines 16-19)*	$ 259,900	$ 131,350	$ 138,750	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:

22. Indirect Charges: IDC set at 48%

23. Remarks: IDC is normally higher, but SWRCB agrees to 48% cap.

TABLE D-1: PROPOSAL SUBMITTAL REQUIREMENTS AND STANDARD CONTRACT CLAUSES

		Services, Consulting, Preconstruction, Research, Land Acquisition					Public Works, Construction				
Item[1]	Standard Clauses and Proposal Requirements[2]	State	Federal	Public	Non-profit	Private	State	Federal	Public	Non-profit	Private
PROPOSAL REQUIREMENTS											
19	Nondiscrimination Compliance			✓	✓	✓			✓	✓	✓
4021	Bidders Bond or other Security (if contract values > $107,000)[3]									✓	✓
4206	Non Collusion Affidavit								✓	✓	✓
n/a	Proof of Contractor's License									✓	✓
CONTRACT REQUIREMENTS											
4100	Contracts with Public Entities			✓					✓		
4099	Service & Consultant Service Contracts with Nonpublic Entity				✓	✓				✓	✓
4099a	Additional Standard Clauses		✓	✓	✓	✓		✓	✓	✓	✓
4187	Interagency Agreements	✓					✓				
4247	Contracts with United States		✓					✓			
4197	General Conditions for Public Works Contracts								✓	✓	✓
4196	Insurance Requirements								✓	✓	✓
18	Nondiscrimination Construction Contract Specifications								✓	✓	✓
807	Payment Bond								✓	✓	✓
156	Performance Bond								✓	✓	✓
n/a	Certificate of Insurance								✓	✓	✓

Legend: State = State of California agencies, including State (California) Universities.
Federal = Federal agencies.
Public = Public entities, such as city, county, other local government entities, resource conservation districts, and out-of-state public entities.
Private = For-profit and non-profit organizations, and individuals.

[1] Item numbering refers to documents following this table.
[2] All contract terms and standard clauses apply to any subcontacts made by Contractor.
[3] Types of security include cashiers check, cash, certified check, or bidder's bond in an amount equal to 10 percent of the proposed amount.

OMB Approval No 0348-0040

ASSURANCES - NON-CONSTRUCTION PROGRAMS

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
Karen Larsen	Environmental Specialist
APPLICANT ORGANIZATION	DATE SUBMITTED
Central Valley Regional Water Quality Control Board	May 15, 2000

Standard Form 424B (Rev. 7-97) Back

U.S. Department of the Interior

Certifications Regarding Debarment, Suspension and Other Responsibility Matters, Drug-Free Workplace Requirements and Lobbying

Persons signing this form should refer to the regulations referenced below for complete instructions:

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions - **The prospective primary participant further agrees by submitting this proposal that it will include the clause titled, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.** See below for language to be used; use this form for certification and sign; or use Department of the Interior Form 1954 (DI-1954). (See Appendix A of Subpart D of 43 CFR Part 12.)

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions - (See Appendix B of Subpart D of 43 CFR Part 12.)

Certification Regarding Drug-Free Workplace Requirements - Alternate I. (Grantees Other Than Individuals) and Alternate II. (Grantees Who are Individuals) - (See Appendix C of Subpart D of 43 CFR Part 12.)

Signature on this form provides for compliance with certification requirements under 43 CFR Parts 12 and 18. The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of the Interior determines to award the covered transaction, grant, cooperative agreement or loan.

PART A: Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions

CHECK __ IF THIS CERTIFICATION IS FOR A PRIMARY COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

PART B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions

CHECK __ IF THIS CERTIFICATION IS FOR A LOWER TIER COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

DI-2010
March 1995
(This form consolidates DI-1953, DI-1954, DI-1955, DI-1956 and DI-1963)

PART C: Certification Regarding Drug-Free Workplace Requirements

CHECK X IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS NOT AN INDIVIDUAL.

Alternate I. (Grantees Other Than Individuals)

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an ongoing drug-free awareness program to inform employees about–
(1) The dangers of drug abuse in the workplace;
(2) The grantee's policy of maintaining a drug-free workplace;
(3) Any available drug counseling, rehabilitation, and employee assistance programs; and
(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will –
(1) Abide by the terms of the statement; and
(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(e) Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted –
(1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

CVRWQCB 3443 Routier Rd
Sacramento, CA 95827
Sacramento County

Check __ if there are workplaces on file that are not identified here.

PART D: Certification Regarding Drug-Free Workplace Requirements

CHECK X IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS AN INDIVIDUAL.

Alternate II. (Grantees Who Are Individuals)

(a) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;

(b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

PART E: Certification Regarding Lobbying
Certification for Contracts, Grants, Loans, and Cooperative Agreements

CHECK __ IF CERTIFICATION IS FOR THE AWARD OF ANY OF THE FOLLOWING AND THE AMOUNT EXCEEDS $100,000: A FEDERAL GRANT OR COOPERATIVE AGREEMENT, SUBCONTRACT, OR SUBGRANT UNDER THE GRANT OR COOPERATIVE AGREEMENT.

CHECK __ IF CERTIFICATION IS FOR THE AWARD OF A FEDERAL LOAN EXCEEDING THE AMOUNT OF $150,000, OR A SUBGRANT OR SUBCONTRACT EXCEEDING $100,000, UNDER THE LOAN.

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL Karen Larsen

TYPED NAME AND TITLE Karen Larsen, Environmental Specialist

DATE May 15, 2000

DI-2010

March 1995

(This form consolidates DI-1953, DI-1954, DI-1955, DI-1956 and DI-1963)

Attachment

Sacramento River Watershed Program

The SRWP was initiated at a stakeholders' meeting in February of 1996 to bring people together who have an interest in the quality of water in the Sacramento River. Stakeholders in the watershed program are citizens, government agencies at all levels, educators, and local citizen groups with economic, regulatory, aesthetic, or personal interests in the quality of the River and its tributaries. The mission of the program, which was developed by the stakeholders, is:

> To ensure that current and potential uses of the watershed's resources are sustained, restored, and where possible, enhanced, while promoting the long-term social and economic vitality of the region.

The Sacramento River Watershed Program (SRWP) is a stakeholder group dedicated to stewardship of the Sacramento River Watershed. Initiated in 1995, the SRWP has been funded in phases corresponding to line item appropriations from the US Congress. In-kind funding has been provided by several Program participants, including the Sacramento Regional County Sanitation District, US EPA, Placer County Resource Conservation District and the Regional Board. The cornerstones of the SRWP are: (1) the water quality monitoring program; (2) the education and outreach program; (3) water quality management strategies for contaminants; and (4) providing information and assistance for tributary watershed groups. Over 1000 individuals are now associated with the SRWP, most of them representing a specific interest or agency.

The water quality monitoring program was initiated in 1996. The monitoring and quality assurance plans were developed, based on stakeholder input, to determine the health of the watershed. Monitoring is initially focusing on the main stem Sacramento River and selected tributaries. The monitoring is coordinated with other ongoing regional monitoring efforts. Parameters include biological and habitat assessments, water column monitoring for minerals, metals, nutrients, pesticides, toxicity and pathogens, fish tissue monitoring for bioaccumulative contaminants and sediment monitoring for toxicity and pollutants. Data are maintained by the Interagency Ecological Program (IEP) and are available on the IEP website. Several technical reports have already been produced. The monitoring program is funded through June 2002.

The education and outreach program focuses on information exchange among stakeholders. The SRWP hosts two education workshops and two stakeholder business meetings each year. A SRWP newsletter, *Waterways*, is published quarterly, along with a calendar of watershed meetings and events. Public Service Announcements have been developed, filmed and are currently being aired on local TV stations. The education and outreach program expanded significantly this year. A SRWP Resource Center maintains a web site for the program and provides assistance to local watershed groups. A full time coordinator, Dennis Bowker, has been hired to coordinate SRWP activities with other regional and local watershed efforts. Allen Harthorn is the new Education coordinator. A K-12 education program will be initiated to augment existing school and community education programs. New outreach materials are being developed, including a set of brochures, a traveling display booth for outreach events, a speakers bureau and press kits.

The Toxics Subcommittee is developing a water quality management strategy for constituents of concern (Figure 1 and 2). The strategy was developed, based on stakeholder input, and is being "ground truthed" with two initial strategies, one for organophosphate (OP) pesticides and another

for mercury. Both strategies explicitly provide the technical information necessary for the completion of TMDLs for 303d listed water bodies in the Watershed. The OP pesticide strategy, coordinated by the Department of Pesticide Regulation, will focus initially on diazinon in the Sacramento and Feather Rivers. The mercury strategy will focus initially on determining the bioavailability of mercury in the Cache Creek and Sacramento River Watersheds. The goal is to determine a safe level of mercury in fish tissues and implement a program to attain these safe levels. The Toxics Subcommittee is also investigating unknown toxicity in the watershed and tracking information on drinking water quality. Several technical reports have already been produced.

Within the Sacramento River Watershed are over 50 smaller tributary watersheds. Many of these watersheds have ongoing local stewardship programs. Placer County RCD and Board staff have received funding for three projects for establishing and coordinating citizen volunteer watershed education and stewardship programs. The general concept behind the grants is to support a consortium of watershed groups throughout the Sacramento River Watershed by providing the essential elements needed to establish their individual programs. The projects provide opportunities for the participating groups to network, exchange ideas, and help nascent volunteer groups to get started, further increasing the efficiency and the rapidity of the transfer of information throughout the Sacramento River Watershed.

SRWP Publications include:

A. **"Sacramento River Watershed Program Toxicity Monitoring Results: 1996-1997"**
Describes results of testing water samples for toxicity to bioassay organisms. Samples were collected throughout the Watershed during July 1996 - June 1997. 205 pp.

B. **"Sacramento River Watershed Program Toxicity Monitoring Results: 1997-1998"**
Describes results of testing water samples for toxicity to bioassay organisms. Samples were collected during Oct 1997 - May 1998.

C. **"Toxicants in Surface Waters of the Sacramento River Watershed"**
Summarizes recent toxicity and contaminant studies, including ongoing monitoring programs and special studies on metals, pesticides and drinking water issues. This report also proposes future research needs and management strategies. 375 pp.

D. **"Sacramento River Watershed Program Phase I Final Report"**
A summary report on the entire Sacramento River Watershed Program, including background, goals, scope of the Program and progress made in the past two years.

E. **"Internet Guide to Watershed-Related Websites"**
A compilation of watershed-related web sites, intended to aid those interested in utilizing the existing resources available on the internet and to reduce their time spent "surfing." All the sites have been categorized into six different types. The Internet Guide is also available as an electronic file of bookmarks (Netscape Navigator, version 3.01). 24 pp.

F. **"Directory of Watershed-Related Projects and Programs in the Sacramento River Basin"**
Describes all of the current watershed related projects and programs in the Sacramento River Watershed. Also identifies Resource Conservation Districts (RCD) in the watershed. All of the projects in the Watershed Directory can be found on the Natural Resources Project Inventory (NRPI) web site, http://endeavor.des.ucdavis.edu/nrpi/, which was created and is maintained by the Information Center for the Environment. 300 pp

G. **"Funding Opportunities for Watershed Programs and Projects, Second Edition"**
Lists current funding opportunities and grant programs. Groups eligible for various programs include non-profit organizations; local conservancies; watershed groups; individuals; resource conservation districts; Native American tribes; and local, state and federal agencies. 35 pp.

H. **"Sacramento River Watershed Program Information for Development of a Watershed Monitoring Program".**
This document was used to create the SRWP monitoring plan. Discusses parameters of interest, current analysis techniques, and their limitations and costs, sampling design, and information that monitoring will be expected to provide. 60 pp.

I. **"SRWP Strategic Communications Plan"**
Master plan developed for the SRWP to guide education and outreach efforts to stakeholders and the general public. 35 pp.

J. **"1997 Compendium of Water Quality Investigations in the Sacramento River Watershed, Sacramento-San Joaquin Delta and San Francisco Bay Area"**
A compilation of information submitted by federal, state and local entities on their water quality monitoring programs. Contains full-color maps of sampling sites, along with information on parameters monitored, frequency, methods of sampling and analysis, compliance standards and sources of additional information for 54 programs in the study area. 147 pp.

K. **"Pilot Study to Integrate Ambient and Compliance Monitoring Programs in the Sacramento River Basin"**
Describes goals and results of a study to determine the effectivenesss of combining efforts of surface water quality monitoring (ambient) with water testing required by discharge permits (compliance). 129 pp.

L. **"Quality Assurance Project Plan for the Sacramento River Watershed Monitoring Program"**
Describes the quality assurance and quality control procedures that have been and will be followed in the monitoring program. Quality Assurance procedures cover methods for equipment preparation, sample collection, sample processing, sample analysis and data evaluation. 100 pp.

M. **"Year One Monitoring Program Report"**
Details the Sacramento River Watershed Program monitoring results for aquatic toxicity assays, water and sediment chemistry analyses, water-borne pathogen testing, analyses of contaminants in fish tissue, and assessment of biological diversity at sites on the Sacramento River and selected tributaries.

N. **"Water Quality Management Strategies: Background Information and Strategy Design"**
Details the process used by the Toxics Subcommittee to understand the condition of the watershed and prioritize management issues. Also includes an overview of the stakeholder process proposed for developing management strategies. 107 pp.

Figure 1. Sacramento River Watershed Program Water Quality Management Strategies

GOAL: Formulate and implement technically valid, cost effective and protective water quality management strategies for a Watershed-Based Water Quality Management Program

Feedback between different tasks will be an integral part of development of water quality management strategies. F example, lists of priority issues and impaired waters will be reevaluated as new data are collected through the SRWP Monitoring Program

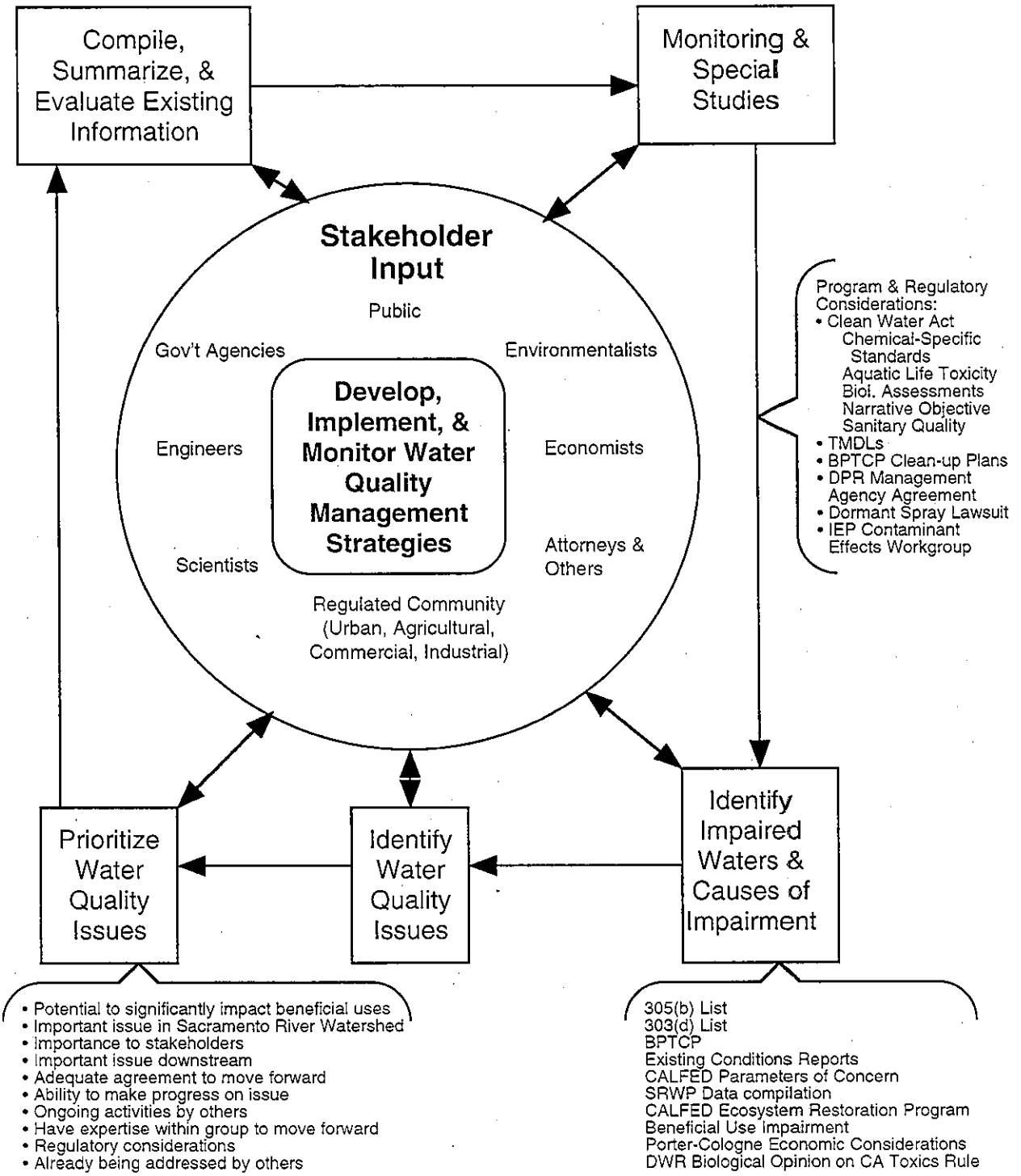
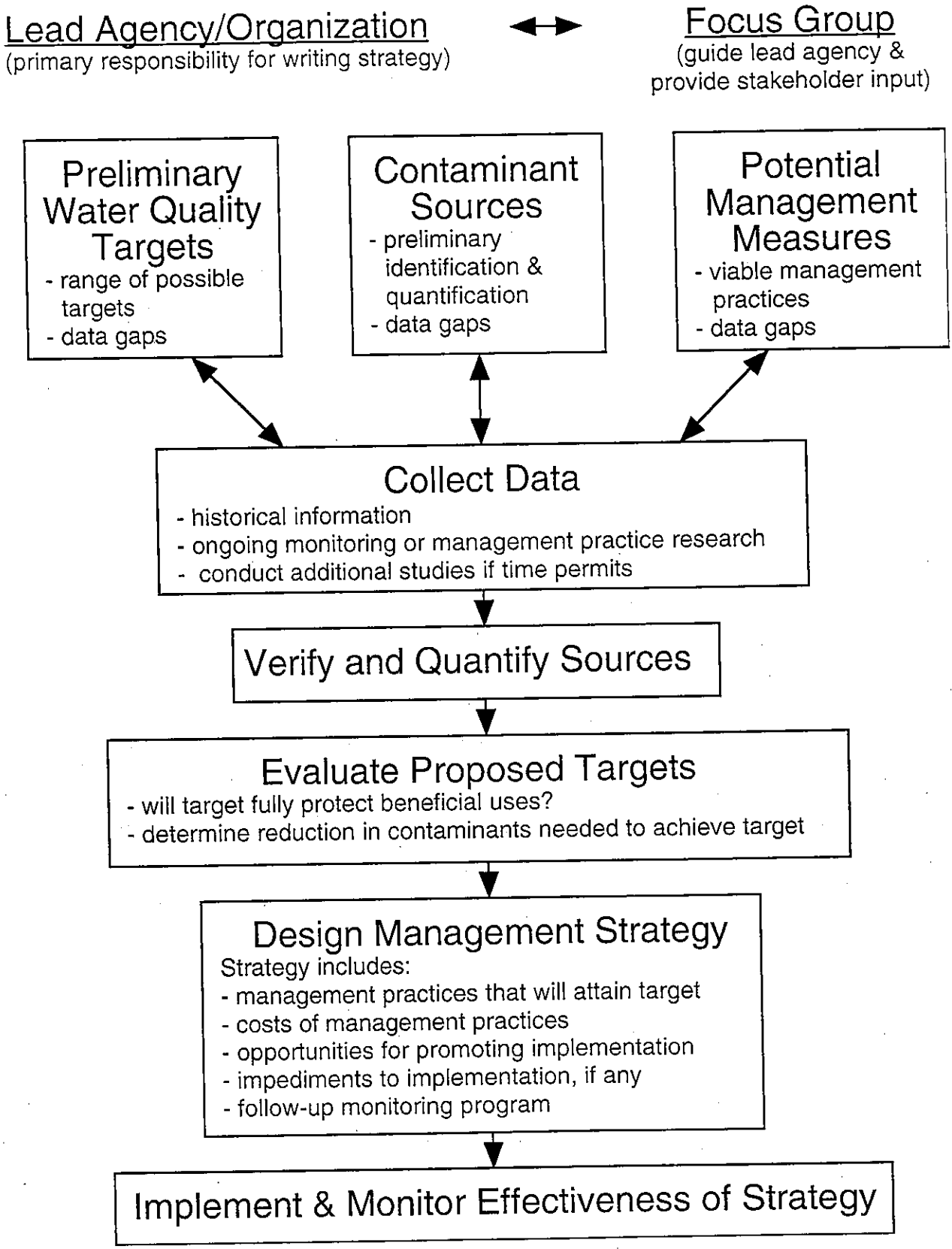


Figure 2. Development of a Water Quality Management Strategy



May 12, 2000

CALFED/Bay-Delta Program Office
1416 9th Street
Suite 1155
Sacramento, California 95814

To Whom It May Concern:

The Sacramento River Watershed Program Monitoring and Toxics Subcommittees would like to express support for the Central Valley Regional Water Quality Control Board's proposal to monitor chronic toxicity to salmonids in the Sacramento River Watershed. This project would provide essential information on the current health of the watershed to salmonids and will provide the program a relevant way of evaluating the effectiveness of restoration projects.

As an in-kind match, the Toxics Subcommittee will serve as a technical advisory committee for the project. Stakeholders serving on this subcommittee include regulators (U.S. Environmental Protection Agency, California Department of Pesticide Regulation, California Department of Fish and Game, California Department of Water Resources, State Water Resources Control Board, Regional Board), local agencies (Sacramento County Regional Sanitation District, the City of Sacramento), and several consultants with extensive experience in water quality issues. The members of the subcommittee will provide their technical expertise to ensure that the proposed project provides ecologically relevant information about the condition of the watershed.

The Monitoring Subcommittee has committed to coordinate their monitoring plan with the proposed monitoring for chronic salmonid toxicity. The SRWP's monitoring will likely include monitoring for constituents of concern, chronic toxicity to invertebrates, and biological assessment. The additional component of chronic toxicity to salmonids will provide a more complete basis for evaluating ecological relevance of monitoring results.

We appreciate your consideration of the proposal.

Stella Siepmann, Member
Toxics and Monitoring Subcommittees

SACRAMENTO RIVER WATERSHED PROGRAM

May 12, 2000

CalFed Bay Delta Grants Program
1416 9th Street, Suite 1115
Sacramento, CA 95814

Subject: SUPPORT FOR CALFED PROPOSAL ON RAINBOW TROUT EGG DEVELOPMENT PROTOCOL

A primary goal of the Sacramento River Watershed Program (SRWP) Monitoring Subcommittee is to "develop a cost-efficient and well-coordinated long-term monitoring program within the watershed to identify the causes, effects, and extent of constituents of concern that affect the beneficial uses of water and to measure progress as control strategies are implemented." As such, a protocol that provides better information on the effects of pollutants on salmonid survival in the watershed would help to achieve this goal.

The Regional Water Quality Control Board staff and AQUA-Science have been active participants in the SRWP Toxicity Focus Group and the Toxicity Subcommittee of the Monitoring Focus Group since 1998. During the first and second years of SRWP monitoring, AQUA-Science provided guidance to the focus group and subcommittee on toxicity testing protocols. AQUA-Science has also been active in the development of test protocols for TIE procedures for surface water and sediment.

Overall, AQUA-Science has been a valuable participant in SRWP's efforts to monitor and manage toxic pollutants in the watershed. We strongly support their proposal to develop new Rainbow Trout Egg Development Test protocol.

Respectfully,

for

SRWP Monitoring Subcommittee